



TRAIN DETECTION
MONITORING



TRACK AND RAIL
MONITORING



SWITCH CONDITION
MONITORING



RAIL CROSSING
MONITORING



SIGNALING POWER
MONITORING

ROADMASTER® RXM

Diagnostic and monitoring
technologies for rail crossings

voestalpine

ONE STEP AHEAD.



DIGITAL PERFORMANCE ON TRACK®

DIAGNOSTIC AND MONITORING TECHNOLOGIES FOR RAIL CROSSINGS

Our intelligent diagnostic and monitoring system ROADMASTER® records the asset condition of your infrastructure continuously and comprehensively. With the ROADMASTER® RXM module, we enable you to prevent failures and optimize maintenance processes connected with rail crossings, which are a critical interface between the railway and the public that require regular maintenance and testing to ensure safety. They represent an increasing risk where levels of rail and road traffic are far higher than originally planned. Despite repeated publicity campaigns, crossing violation and misuse are a common problem in many parts of the world and rail crossings are frequently damaged by road vehicles putting safety at risk. ROADMASTER® RXM monitors and records the performance of rail crossings to enable a comprehensive diagnosis of problems that may occur, which shortens response times, ensures optimum availability and allows the implementation of proactive condition-based maintenance.

That's what we stand for. For Digital Performance on Track®.

RAIL CROSSING MONITORING WITH ROADMASTER® RXM

The RXM concept is based on a modular design, which allows easy expansion to include additional monitoring and integration with existing railway and IT systems on a number of levels. The system monitors and records the performance of rail crossing equipment, timing and sequences to enable proactive maintenance, prevent failures and reduce test times when investigating incidents and allegations. No matter what rail transport or application area.

No matter what rail transport or application area – RXM can be used by all railways:

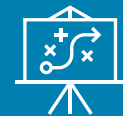


Why use diagnostic and monitoring systems for rail crossings?

- » Rail crossing systems are a complex and vital infrastructure asset
- » Highly visible, safety critical interface between the railway and other traffic
- » Operational criticality and risk profile drives significant maintenance requirements
- » Asset failures disrupt road and rail traffic
- » Safety incidents create major reputational damage
- » Ensures optimal availability of rail crossing



ACTION /
REMEDY



FORECAST



INFORMATION



COLLECT
DATA

HOW DOES RAIL CROSSING MONITORING WORK?

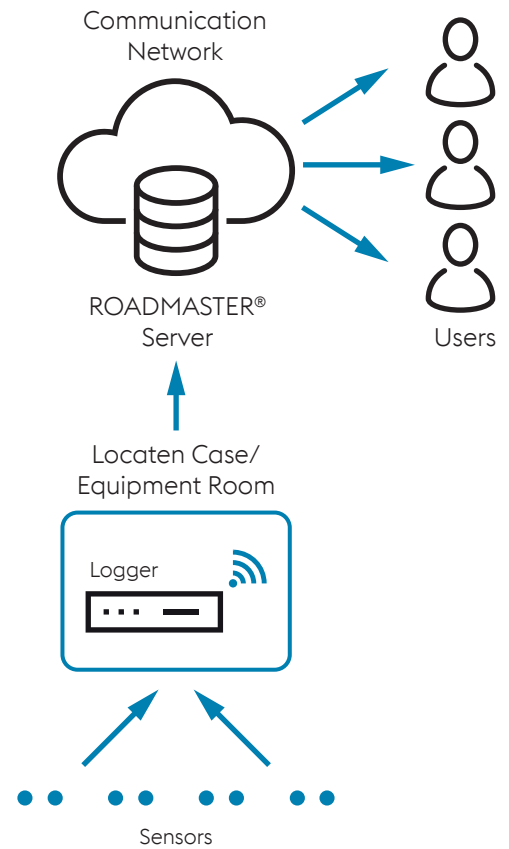
RXM consists of sensors to measure physical or electrical parameters, field units including loggers and network equipment to collect, format and transmit the real time data and a back office server to analyze the accumulated data, announce alarms as required and host the web based user interface. Modular design supports quick and efficient installation inside control cabinets or equipment rooms.

By ROADMASTER® RXM monitoring the control inputs to a rail crossing, utilizing non-invasive CTs, sensors and spare relay contacts, the complete rail crossing control sequence can be monitored.

ROADMASTER® RXM ranges from providing basic event recording to condition monitoring including performance analysis.

Intelligent analysis of the data collected enables the system to identify deterioration in condition and allow intervention – crucially before a failure occurs.

This advance warning provides a vital timeframe in which maintenance work can be scheduled to restore normal operation.

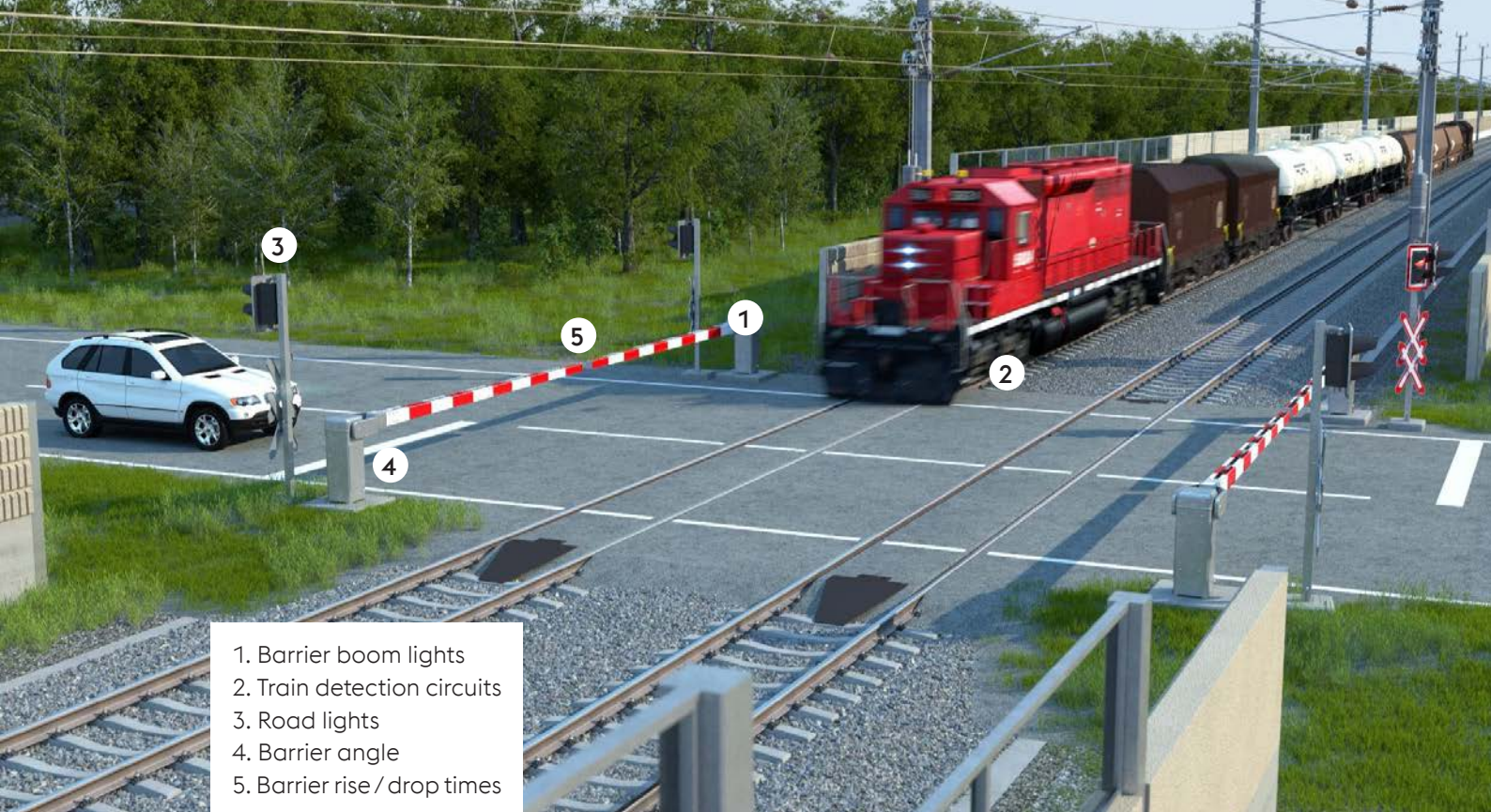


ROADMASTER® RXM Benefits

- » Remote monitoring of condition, timings and sequence on every operation
- » Enables introduction of more efficient maintenance regimes and reduces life cycle costs
- » Remote diagnosis of faults helps to avoid failures and significant disruption
- » Records operational sequencing which can be used to support incident investigations
- » Long term trending provides customizable detailed reporting of rail crossing condition
- » ROADMASTER® provides visualizations of alarms, condition and control relay sequence

Key Features

- » Modular, scalable and configurable design
- » Compact data acquisition unit, similar in size to a typical signaling relay
- » Fully isolated digital and analogue inputs
- » Integral LTE/GPRS/EDGE modem
- » Event data can be downloaded locally via USB
- » Available via laptop, PC or internet enabled mobile device



1. Barrier boom lights
2. Train detection circuits
3. Road lights
4. Barrier angle
5. Barrier rise/drop times

WHAT WE MONITOR

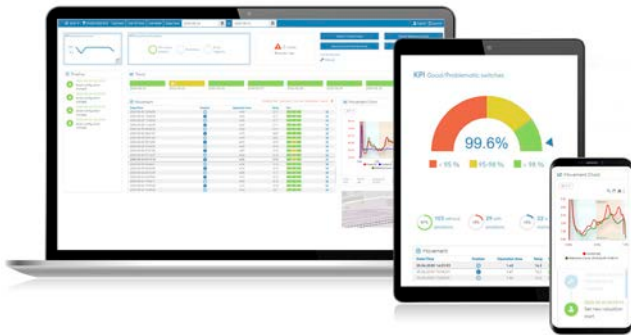
- » Event recording
- » Power supply and battery condition
- » Track circuits
- » Warning lamp timings, on/off, boom lights, flasher units and flash rate
- » Barrier rise/drop times
- » Barrier angles
- » Audible warning device
- » Barrier motor profiles
- » Strike in/out timings
- » Road closed times
- » Bulb currents
- » Correct sequence followed
- » Hydraulic pressure
- » Train speed
- » Earth leakage
- » Rail temperature
- » Ambient temperatures
- » Wind speed and direction

HARDWARE & SOFTWARE FROM A SINGLE SOURCE

ROADMASTER® RXM provides all components, from hardware to software, as a system and complete solution. This means that you save on interfaces and get everything

– from data acquisition to data analysis – from a single source. The system versions can be configured to meet your requirements.

OVERVIEW OF SYSTEM ELEMENTS



Sensors detect measured variables for determining the performance and condition of the rail crossing system.

Data recording by using modular hardware (with flexible options), which has been developed specifically for railway applications.

Software modules analyze the acquired data to provide the user with information about the asset condition as well as performance statistics using integrated visualization software.

Integration of ROADMASTER®

Our visualization software enables easy and intuitive operation via a multilingual user interface. Seamless monitoring of the operating state is possible on any PC, tablet or common smartphone, regardless of platform, by means of web-based software. As a result, the state of the track or of fixed assets is continuously available and is comprehensively analyzed and displayed. A clearly displayed overview of the asset conditions saves time and guarantees that you can focus on the essentials.

- » Visualization of the asset condition
- » Analytics
- » Alarms
- » KPIs and reporting

ROADMASTER® RXM can operate as a stand alone system or can be integrated with other software platforms to satisfy the customers specific requirements.

Interfaces include:

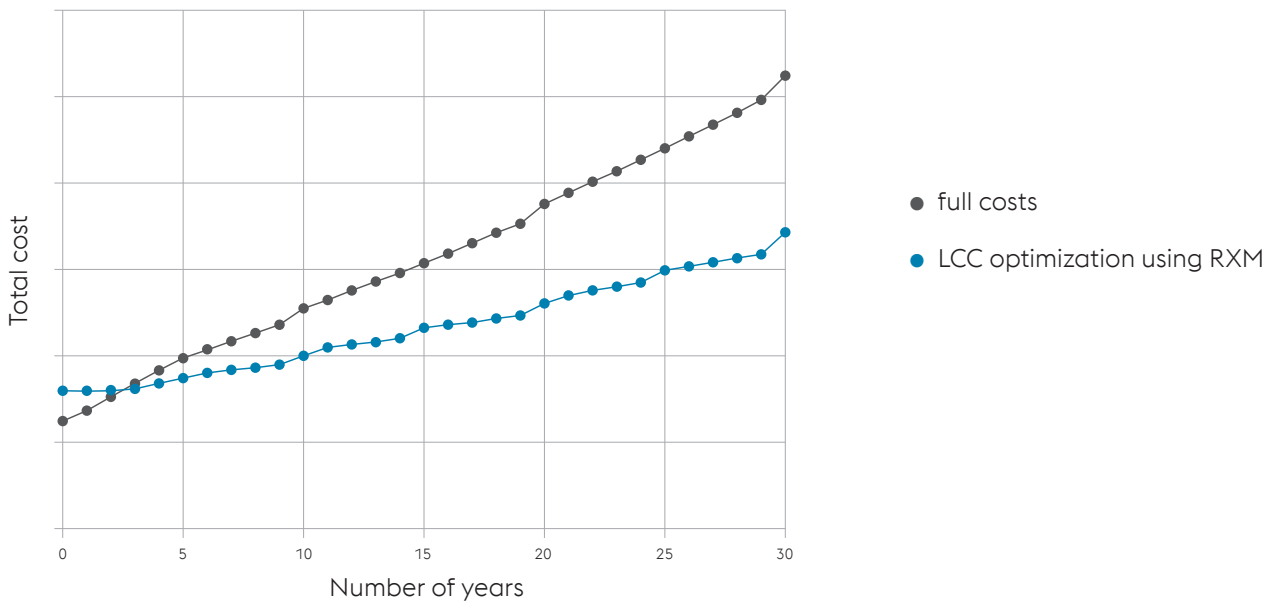
- » OPC-UA
- » Web services
- » Interface development in coordination with the customer is possible

MEASURABLE LCC OPTIMIZATION OF THE RAILWAY INFRASTRUCTURE

Life Cycle Cost Models are an increasingly important tool used in the rail industry in asset management. By relying on decades of experience and data, we can demonstrate the economic effects and benefits of using ROADMASTER® RXM and thereby reinforce the trust of our customers.

- » The calculations are based over a 30 year expected life of an automatic barrier system
- » The LCC model shows typically a 2-3 year payback for ROADMASTER® RXM

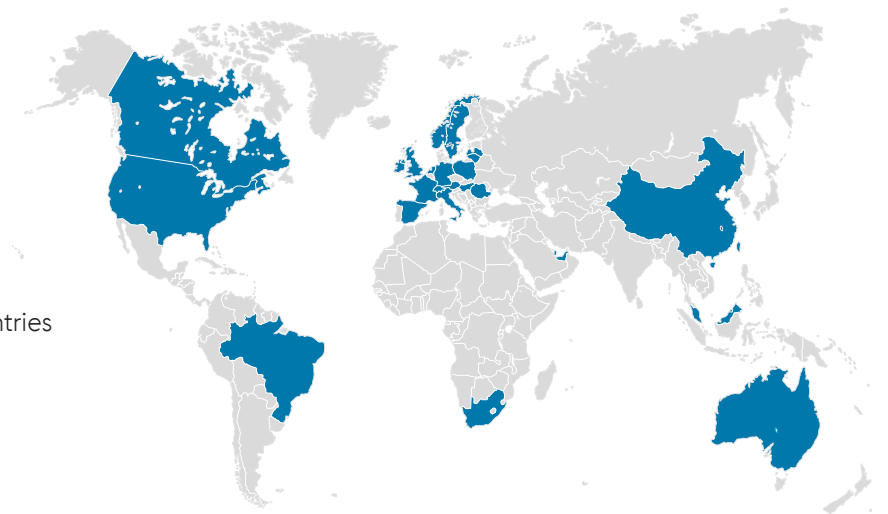
LCC optimization using RXM



WHY CHOOSE US?

Domain expertise, competency and more than 160 years of experience in the international turnout business guarantee your “digital” Performance on Track®.

- » Reference projects in more than 25 countries
- » Monitoring of more than 40,000 assets
- » Up to 40 % fewer asset failures
- » Higher availability of railroad lines



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